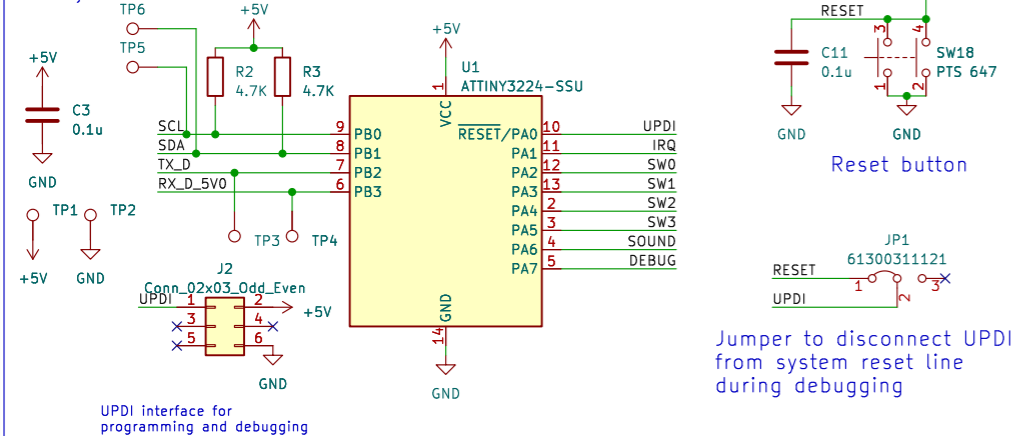


MICROCONTROLLER

The ATtiny3224 microcontroller (MCU) implements all logic to play mancala and keep the game state in memory

Contains interfaces to both the LED driver and button interface circuitry

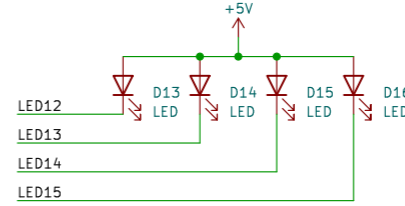
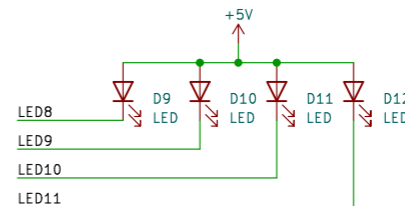
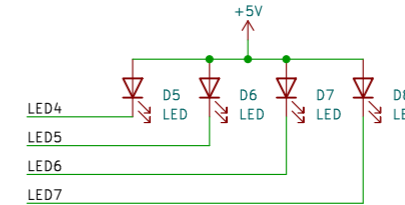
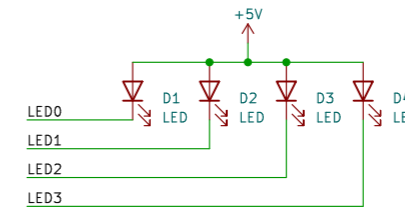
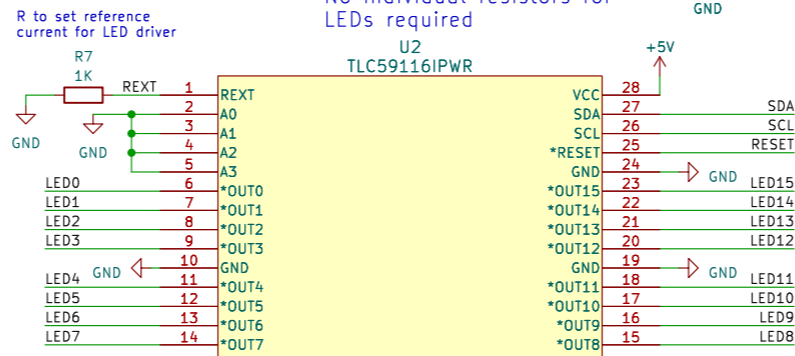


UPDI interface for programming and debugging

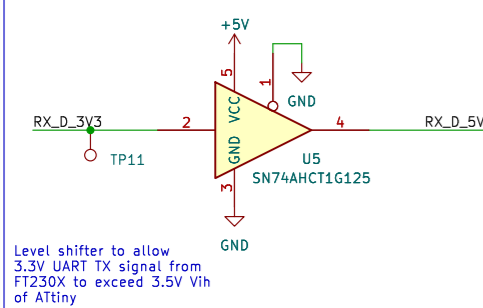
LEDS AND LED DRIVER CIRCUITRY

The LEDs display the current game state and are driven by an LED driver IC controlled by the MCU over I2C

Constant-current LED driver
No individual resistors for LEDs required



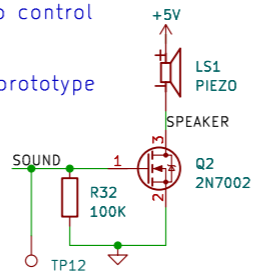
LEVEL SHIFTING



Level shifter to allow 3.3V UART TX signal from FT230X to exceed 3.5V Vih of ATtiny

PIEZO

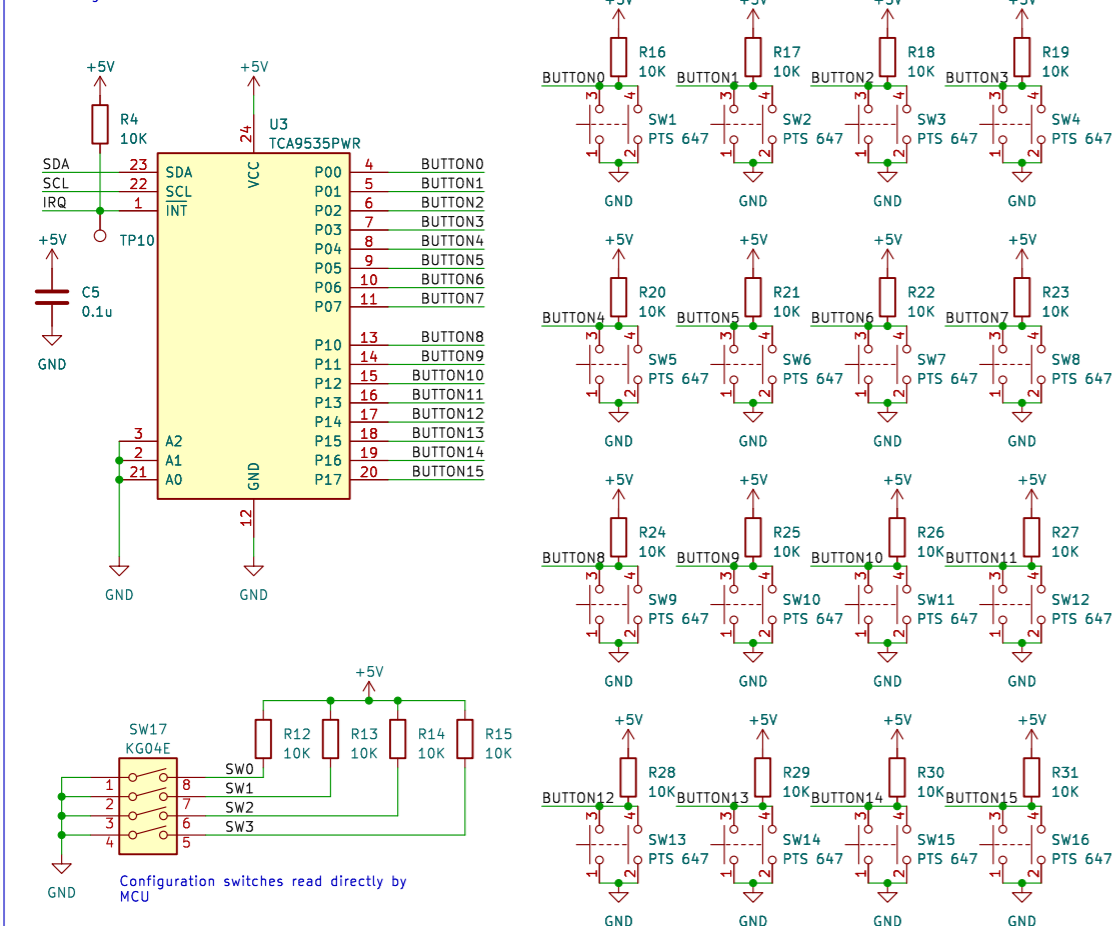
Logic-level FET to control piezo
Not used in first prototype



BUTTONS AND SWITCHES

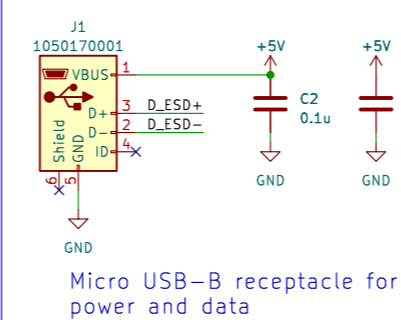
Game buttons are read through 16-channel I2C I/O expander

I2C I/O expander triggers interrupt on MCU upon state change

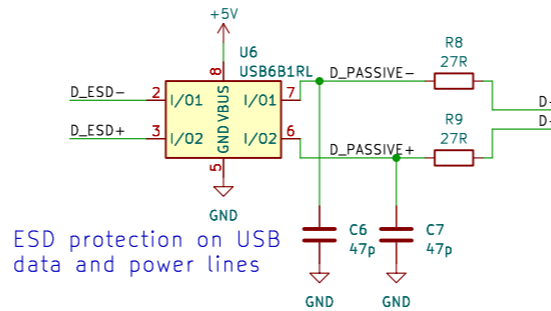


Configuration switches read directly by MCU

USB INTERFACE



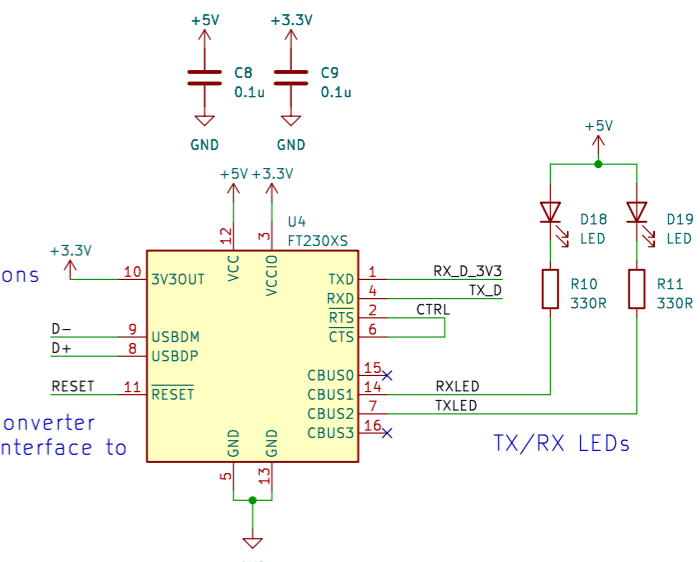
Micro USB-B receptacle for power and data



ESD protection on USB data and power lines

Passives follow FTDI datasheet recommendations for FT230X

USB to serial converter to add a USB interface to ATtiny3224



TX/RX LEDs